STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

PROGRAM DIRECTIVE

TR-0011 (New 3/14/2000)

TRAFFIC OPERATIONS PROGRAM DIRECTIVE	NUMBER **00-04**	PAGE 1 OF 2 (plus attachments)
KIM NYSTROM, PROGRAM MANAGER *(Signature)*	DATE ISSUED JAN 4, 2001	EFFECTIVE DATE Immediately upon issue

SUBJECT

Profiled Thermoplastic Traffic Stripe

DISTRIBUTION

- ☐ All District Directors
- ☒ All District Division Chiefs - Traffic Operations
- ☒ All District Division Chiefs - Maintenance
- ☒ All District Division Chiefs - Construction
- ☒ All District Division Chiefs - Project Development
- ☐ All District Division Chiefs - Planning
- ☒ Engineering Service Center Director
- ☒ All Headquarters Program Managers (for Maintenance, Construction & Project Development)

DOES THIS DIRECTIVE SUPERSEDE ANOTHER DOCUMENT?	☐YES ☒NO	IF YES, DESCRIBE
WILL THIS DIRECTIVE BE INCORPORATED IN THE TRAFFIC MANUAL?	☐YES ☒NO	IF YES, DESCRIBE

DIRECTIVE

Effective immediately, project engineers may specify profiled thermoplastic traffic stripe without special approval from the Headquarters Traffic Operations Program. There are two basic types of profiled thermoplastic traffic stripe. These are: 1) inverted profile, and 2) raised and inverted profile (please see attachments). Inverted profile traffic stripe provides enhanced wet-night retroreflectivity. Raised and inverted profile traffic stripe provides enhanced wet-night retroreflectivity, and auditory and tactile effects. Profiled thermoplastic traffic stripe may be used under the following conditions: 1) On roadways that do not require snow removal, 2) Where pavement maintenance treatments, which would require removal of the thermoplastic, are not planned within three years, 3) In areas where limited shoulder widths or structural constraints do not allow rumble strips to be placed, and where tactile and auditory effects are desired. Profiled thermoplastic standard special provisions and construction details are available for use by project engineers.

IMPLEMENTATION

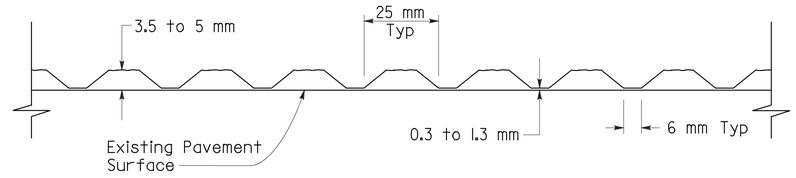
Project Engineers may specify profiled thermoplastic traffic stripe on new roadways, on pavement resurfacing projects or restriping projects. Standard special provisions and construction details for profiled thermoplastic traffic stripe are available from the Engineering Service Center, Division of Office Engineer. Project Engineers should consult with Traffic Operations District Liaisons to review projects for delineation improvements and identify benefits of profiled thermoplastic traffic stripe.

Project Engineers are further encouraged to learn of the experience gained by experimental profiled thermoplastic installations in their district and other districts. Profiled thermoplastic traffic stripe shall not be placed on roadways in snow removal areas. Project engineers should consult with district maintenance personnel to identify preventive maintenance and rehabilitation schedules that will assure this traffic stripe will be in use a minimum of three years before maintenance strategies or pavement rehabilitation will require removal of the thermoplastic. Profiled thermoplastic traffic stripe may not be suitable for use on open-graded or seal coated surfaces.

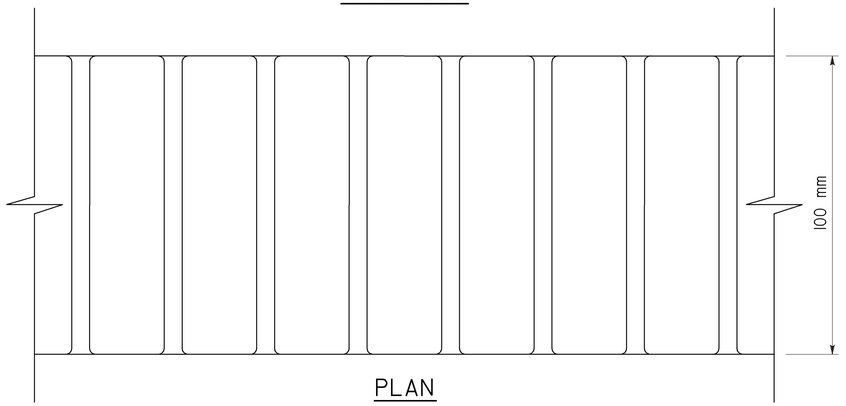
BACKGROUND

Profiled thermoplastic traffic stripe has been used on State highways on an experimental basis since 1993. The inverted profile allows the flow of surface drainage across the traffic stripe, while still providing retroreflectivity during periods of wet surface conditions and darkness. Flat line traffic stripe may become less retroreflective in wet, nighttime conditions. Inverted profile thermoplastic traffic stripe has demonstrated superior wet-night retroreflectivity. Enhanced visibility, due to the inverted profile, is the primary benefit. Tactile and auditory effects of the raised and inverted profile are secondary benefits.

With this Directive, profiled thermoplastic traffic stripe is no longer considered experimental on state highways. Construction details attached, provide drawings that describe the features for the two types of profiled thermoplastic traffic stripe approved with this directive. If other profiled treatments are developed in the future, which provide similar delineation benefits, this directive will be amended.

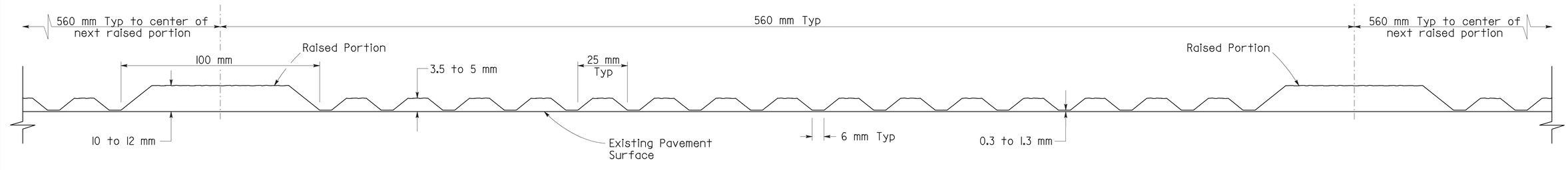


ELEVATION

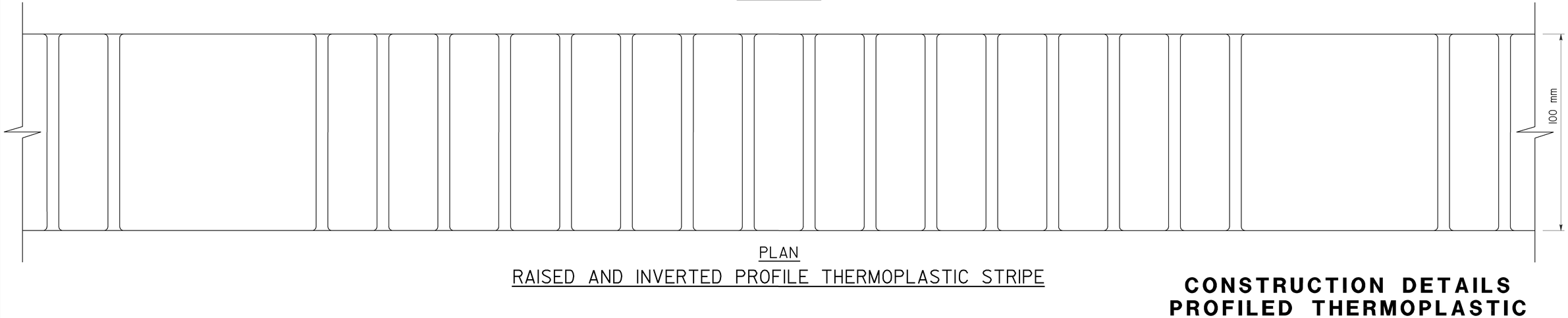


PLAN

INVERTED PROFILE THERMOPLASTIC STRIPE



ELEVATION



PLAN

RAISED AND INVERTED PROFILE THERMOPLASTIC STRIPE

CONSTRUCTION DETAILS PROFILED THERMOPLASTIC TRAFFIC STRIPE

NO SCALE

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

C-1

Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER No. Exp. CIVIL STATE OF CALIFORNIA

DATE | REVISED BY | DATE REVISED

CALCULATED/ DESIGNED BY

CHECKED BY

PROJECT ENGINEER

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

ESC-OE LAST REVISED DATE 11-01-00

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80 100

USERNAME => NULL
DGN FILE => 59-910076#0001_07082803

CU 00000

EA 000000

LAST REVISION 00-00-00

DATE PLOTTED => 7-Dec-2000
TIME PLOTTED => 08:28

Profiled Thermoplastic is placed in either the inverted profile configuration or the raised & inverted profile (with a raised portion at 560 mm on center). Designate the type on the plans.

Profiled Thermoplastic Traffic Stripe shall not be used on pavement subject to snowplowing.

Profiled Thermoplastic Traffic Stripe may not be suitable for use on open-graded or seal coat surfaces or other roadway segments scheduled for preventative maintenance or rehabilitation work within 3 years.

Include Construction Detail sheet in the plans.

Use Contract Item Code:

840513 Profiled Thermoplastic Traffic Stripe

10-1.__ PROFILED THERMOPLASTIC TRAFFIC STRIPE

Profiled thermoplastic traffic stripe (traffic lines) shall conform to the provisions in Section 84, "Traffic Stripes and Pavement Markings," of the Standard Specifications and these special provisions.

2

Profiled thermoplastic material shall conform to the requirements of State Specification PTH 499A.

3

Profiled thermoplastic traffic stripe shall be inverted profile or raised and inverted profile, as designated on the plans.

4

During application of the thermoplastic material, the pavement shall be clean and completely dry, the temperature of the pavement shall be between 16°C and 60°C, and the temperature of the thermoplastic material shall be as recommended by the manufacturer. A primer of the type recommended by the thermoplastic manufacturer shall be applied whenever the pavement temperature is below 22°C and also when applying inverted profile thermoplastic to portland cement concrete pavements, asphalt concrete pavements over 6 months old, or over existing striping.

5

The thermoplastic material shall be applied at a minimum thickness of 2.8 mm before being profiled. The viscosity and thixotropy of the applied thermoplastic shall be such that the thermoplastic line shall retain its profile height and shape, and shall not flow or flatten while cooling or when bearing traffic.

6

Glass beads shall be applied to the surface of the molten thermoplastic material in 2 equal applications at a combined total rate of not less than 70 kg of glass beads per kilometer of 100 mm wide solid stripe.

7

At least 14 days prior to the scheduled start of production of profiled thermoplastic, the Contractor shall submit a written Quality Control Plan to the Engineer. At the request of the Engineer or the Contractor, the Contractor shall discuss details of the Quality Control Plan with the Engineer. The Engineer shall review and approve the Quality Control Plan in writing, prior to the placement of the test stripe.

8

The Quality Control Plan shall describe the organization and procedures that will be used to administer the quality control system, including the procedures used to control the production process, the procedures used to determine when changes to the production process are needed, and the procedures proposed to be used to implement the required changes.

9

Profiled thermoplastic production and placement shall not begin until the Engineer approves the Quality Control Plan in writing. Approval of the Quality Control Plan does not imply a warranty by the Engineer that adherence to the plan will result in production of acceptable profiled thermoplastic. It shall remain the responsibility of the Contractor to demonstrate such compliance.

10

The Quality Control Plan shall include the name and qualifications of a Quality Control Manager, experienced with the equipment, materials, and application of profiled thermoplastic traffic striping. The Quality Control Manager shall be responsible for the administration of the Quality Control Plan, including compliance with the plan and plan modifications. The Quality Control Manager shall be responsible to the Contractor and shall have the authority to make decisions concerning the quality of the work or product. Except in cases of emergency and with the written approval of the Engineer, the Quality Control Manager cannot be a foreman, member of the production or striping crew, an inspector, or tester on the project during stripe production and placement.

11

The Quality Control Plan may be modified as work progresses. A supplement shall be submitted in writing to the Engineer whenever there are changes to quality control procedures or personnel. Profiled thermoplastic production and placement shall not resume or continue until the Engineer approves the revisions to the Quality Control Plan in writing.

12

Prior to application, and in the presence of the Quality Control Manager, the Contractor shall place a test stripe on roofing felt or other suitable material to demonstrate the Contractor's abilities to apply a stripe with the desired profile for a minimum length of 15 meters. The Contractor shall not place striping material on the roadway without the approval of the Engineer. The Engineer shall require the Contractor to delay installation of the material if, in the opinion of the Engineer, the Contractor does not have suitable equipment or skills to place the striping materials in a suitable manner. If the Contractor’s initial test stripe is not approved, the Quality Control Manager shall work with the Contractor to perform the necessary training and adjustments to repeat the test stripe application to the satisfaction of the Engineer.

13

The Contractor shall provide a profile template or profile height gauge to the Engineer during application and inspection of the thermoplastic striping to determine if the applied thermoplastic line is profiled to match the plans.

14

The Quality Control Manager shall be present during placement of the test stripe, the initial application, the final application, and at selected intervals as outlined in the Quality Control Plan. The Quality Control Manager shall immediately alert the Contractor and the Engineer to anything that could affect the performance of the product. The Quality Control Manager shall ensure that materials are placed in conformance with accepted procedures.

15

Profiled thermoplastic traffic stripe will be measured and paid for in the same manner specified for thermoplastic traffic stripe in Section 84-2, "Thermoplastic Traffic Stripes and Pavement Markings," of the Standard Specifications.